Relative Dating/Order of Events/Rock Sequences

Name:_____ Block:_____ Lab Partner(s):_____

Introduction:

Geology is a science that is in part based on the concept of time. In fact geologist use the term "time" in a different way than most people. For geologists, time is referred to as **geologic time**. Geologic time refers to the past 4.6 billion years of Earth's existence. Geologists use both relative and absolute dating methods to determine the age of events in the past. Relative dating puts events in order of sequence; what happened first, second, and so on. In this lab, you will investigate geologic cross sections/sequences to determine the relative age of each layer.

Directions:

After answering the pre-lab questions below, you will determine the geologic history of each of the three cross sections.

For each diagram, list the geologic event description **and** the layer(s) that was/were involved. You may also use the name of the rock in the layer itself rather than the letter if you chose. In each sequence, **you will start at the bottom** (oldest event**) and work your way up towards the top** (most recent event).

*Possible geologic events in each sequence are as follows: *Submergence, deposition of rock layer _____, uplift, erosion, faulting, folding, tilting, igneous intrusion/extrusion, and contact metamorphism.*

Some events can occur simultaneously. For example, an igneous intrusion would cause contact metamorphism to happen simultaneously/at the same time, thus they would be listed as one event.

If you feel the need to add additional steps, please do so. If you still have spaces left blank, it is possible you included two events at the same time. So long as your relative history makes sense and does not leave anything out, this is OK!

Pre-Lab Questions:

1.) Define the Law of Superposition:

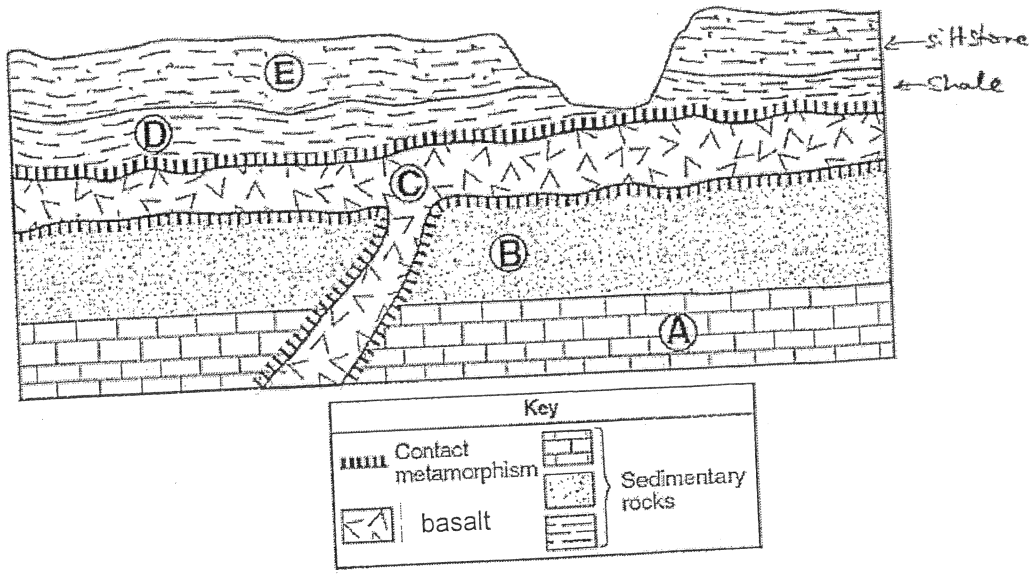
2.) Define the Law of Original Horizontality:

3.) Define the Law of Cross Cutting (and what two geologic events does this apply to?)

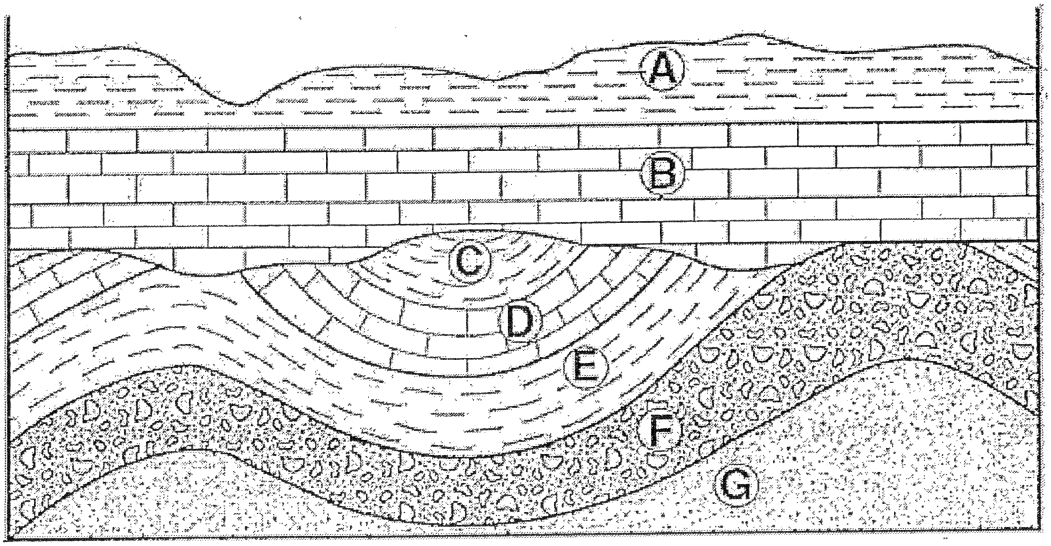
4.) Define the Law of Folding:

5.) What is an unconformity? In defining and unconformity, explain how they form.

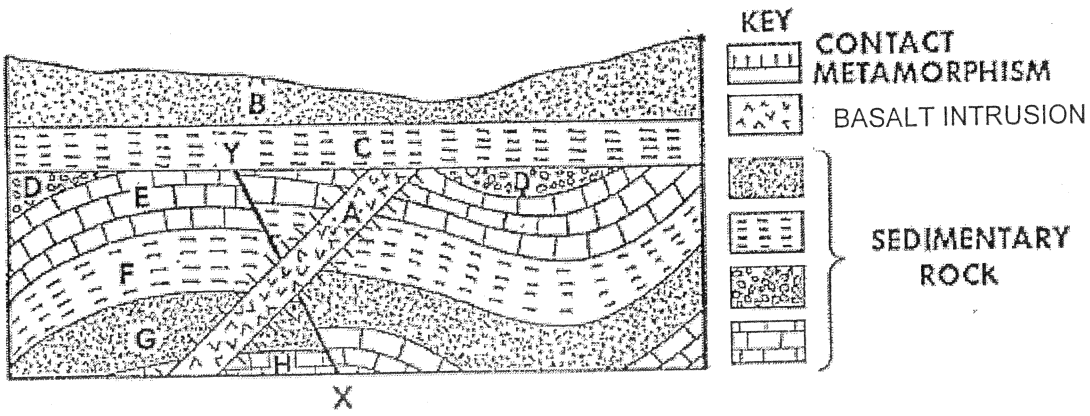
CROSS SECTION #1



CROSS SECTION #2:



Cross Section #3



Report Sheet

Sequence #1

Order of Events	Description of Event AND layer(s) influenced
9	
8	
7	
6	
5	
4	
3	
2	
1	

Sequence #2

Order of Events	Description of Event AND layer(s) influenced
12	
11	
10	
9	
8	
7	
6	
5	
4	
3	
2	
1	

Sequence #3

Order of Events	Description of Event AND layer(s) influenced
14	
13	
12	
11	
10	
9	
8	
7	
6	
5	
4	
3	
2	
1	

Conclusion Questions:

1.) Go back into diagrams #1, 2 and 3. Highlight or draw a thick line to show the locations of the unconformities in each of the three cross sections.

2.) State one piece of evidence shown in cross section #1 that indicates that rock unit D is older than igneous intrusion C

3.) State one piece of evidence shown in cross section #3 that indicates that igneous intrusion A is older than rock layer C.

4.) For cross section #2, use the following information to answer the question.
   a. The cross section is from NYS
   b. The age of rock layer C is 310 million years old
   c. The age of rock layer B is 190 million years old

Which time **periods** are missing from the rock record?

During which geologic time period did this unconformity occur?

5.) For cross section #3, Rock layer B is 270 million years old. **Could** this rock be found in NYS? If so, where?

6.) Rock layer G in cross section #3 dates to 210 m.y.
   a. What index fossil could be found in this layer if it was in NYS?

   b. The only place one could find these fossils in NYS is located where according to pg. 2 and 3 of the reference table?